The PNP Index – A New Metric for Evaluating Financial Performance

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Abstract

The **PNP Index (Positive-Negative Probability Index)** is a newly developed metric designed to assess financial performance by balancing **returns and volatility** in a unique way.

This paper introduces the concept, explains its mathematical formulation, and demonstrates its superiority over existing measures through backtesting and historical market data analysis.

The PNP Index represents a new, more **robust measure of financial performance**, balancing **return probability and volatility** more effectively than traditional metrics. Its ability to work seamlessly with **logarithmic returns** makes it ideal for backtesting and quantitative trading models.

By adopting the PNP Index, traders and analysts can gain **better insights into market behavior** and develop **superior investment strategies**.

PNP Index –> Positive-Negative Probability

Introduction:

The PNP Index (Positive-Negative Probability) is an innovative analytical tool designed to assess investment quality by weighing the relationship between positive returns and volatility. This index was developed out of both academic and practical necessity for effectively analyzing investment performance, particularly in the contexts of backtesting, financial algorithm evaluation, and trading strategy enhancement.

Defining the Index

The PNP Index is designed to assess the performance of stocks, indicators, and trading strategies by examining the ratio of total positive returns to the sum of absolute returns (both positive and negative). The index relies on logarithmic returns, which more accurately represent relative changes in an asset over time.

The formula:

$$PNP = \frac{\sum_{i=1}^{n} R_i^+}{\sum_{i=1}^{n} |R_i|}$$

Where:

- R_i^+ represents the positive logarithmic returns for day i,

- $|R_i|$ is the absolute value of all logarithmic returns (positive and negative),

- n is the total number of observations.

Unique Features of the Index

1. **Clear Value Scale**: The PNP Index provides values between 0 and 1.
   A value of 0.5 describes the most uncertain state, while a value of 1 represents the highest certainty in favor of long positions, and a value of 0 represents the highest certainty in favor of short positions.

2. **Tool for Assessment and Comparison**: Thanks to its clear value scale, the index serves as an excellent tool for comparing stocks, indices, or indicators, enabling the identification of the best outcomes.

3. **Consideration of Both Return and Volatility**: The index integrates the impact of volatility and return. For instance, two assets with identical returns but different volatilities will receive different values, with the more volatile asset being closer to 0.5, indicating less favorable performance.

Advantages of the Index:

1. **Neutralization of Compound Interest and Inverse Compound Interest Effects** – The index is based on logarithmic returns, enabling consistent and distortion-free analysis over time.

2. **Symmetric Weighing of Risk and Return** – The PNP Index does not ignore losses, making it a more precise tool than traditional indices that rely solely on averages and standard deviation.

3. **Multi-Timeframe Analysis** – The index can be calculated for different time periods:

$$P_d - \text{Daily}, \ P_w - \text{Weekly}, \ P_m - \text{Monthly}, \ P_y - \text{Yearly}$$

4. **Application in Algorithmic Trading and Machine Learning** – The index aids in identifying successful strategies and is particularly useful for improving AI-based trading systems.

Potential Applications:

1. **Assessment of Assets with Significant Positive Returns** – Enables the selection of stocks based on an optimal return-to-volatility ratio.

2. **Enhancement of Trading Strategy Performance** – Helps in identifying strategies with high improvement potential in backtesting.

3. **Evaluation of Institutional Investments and Funds** – Provides a clear measure of financial management quality.

4. **Integration in Financial Forecasting Systems** – Can serve as a supplementary metric in machine learning for market trend analysis.

5. **Simple Calculation and Easy Implementation** – PNP is simple to compute and can be efficiently integrated into computer code for automated analysis.

Conclusion:

The PNP Index represents a significant methodological advancement in assessing returns relative to volatility. The ability to weigh both positive and negative returns together using logarithmic returns allows for a more reliable and accurate analysis compared to traditional indices.

This index serves as a valuable tool for investors, researchers, and portfolio managers seeking a clear and balanced understanding of asset performance, improving financial algorithms, and identifying winning investment strategies.

Mathematical Formulation:

The PNP Index is calculated as follows:

1. **For daily returns (Pd):**

$$Pd = \frac{\sum_{i \in P_d} r_i}{\sum_{i \in P_d \cup N_d} |r_i|}$$

Where:

- P_d: Set of days with positive logarithmic returns.

- N_d: Set of days with negative logarithmic returns.

- r_i: Logarithmic return for day i.

- $|r_i|$: Absolute value of the logarithmic return for day i.

2. **For weekly returns (Pw):**

$$Pw = \frac{\sum_{i \in P_w} r_i}{\sum_{i \in P_w \cup N_w} |r_i|}$$

Where:

- P_w: Set of weeks with positive logarithmic returns.

- N_w: Set of weeks with negative logarithmic returns.

- r_i: Logarithmic return for week i.

3. **For monthly returns (Pm):**

$$Pm = \frac{\sum_{i \in P_m} r_i}{\sum_{i \in P_m \cup N_m} |r_i|}$$

Where:

- P_m: Set of months with positive logarithmic returns.

- N_m: Set of months with negative logarithmic returns.

- r_i: Logarithmic return for month i.

4. **For yearly returns (Py):**

$$Py = \frac{\sum_{i \in P_y} r_i}{\sum_{i \in P_y \cup N_y} |r_i|}$$

Where:

- P_y: Set of years with positive logarithmic returns.

- N_y: Set of years with negative logarithmic returns.

- r_i: Logarithmic return for year i.

Appendices:

- Simple Return vs. Logarithmic Return
- Return and Volatility in the PNP Project
- Net Profit and Certain Probability
- Short Selling with PNP
- Example: Demonstration of the PNP Index
- PNP Index vs. Sharpe Ratio

Simple Return vs. Logarithmic Return – additional aspects

Introduction:

Simple Return – Logarithmic Return

In capital market investments, there is a distinction between two main types of returns: simple returns and logarithmic returns. While the formulas are well-known and professionals among us know how to assess the differences between these types of returns, in this article, I will provide additional aspects and a deep understanding from other perspectives of the differences between them. For example, why in simple returns, when a stock drops from a price of 200 to 100, it's a loss of 50%, but when it rises back from 100 to 200, it's a gain of 100%? By the way, in logarithmic returns, this would be a loss of 69.3% and a gain of 69.3%, which is the same in both directions!

Body of the Article:

Simple Returns: When we examine a stock that has risen from a price of 100 to 200, we need to understand that the change can happen in a single transaction at the final price of 200 or through numerous transactions at different price levels, with the last one ending at 200. Let's assume that 10 transactions were conducted on the journey from 100 to 200 consecutively, for example: 100, 110, 120, 130, and so on until 200. Let's say our investment amount is $1,000 at a price of 100, and we examine the investment amount on the journey to a price of 200. We will see that the investment amount grows and grows after each transaction; this is the effect of compound interest, where the profit from a completed transaction is added to the investment amount and participates in the subsequent rises.

The opposite occurs during declines. Let's say we invested $1,000 at a price of 200 down to 100 over 10 consecutive transactions, for example: 200, 190, 180, and so on until 100. In this case, we'll examine the investment amount and see that it decreases and decreases after each transaction. The reason is due to an effect opposite to compound interest, which I call the effect of inverse compound interest.

Due to the effects of compound interest and inverse compound interest, in simple returns, profit is unlimited, while loss is capped at 100%.

Logarithmic Returns: In logarithmic returns, we essentially neutralize the effects of compound interest and inverse compound interest. How is this done? By subtracting the profit after each profitable transaction from the investment amount and compensating for the loss after each losing transaction. That is, the investment amount remains constant! From this, we deduce that in logarithmic returns, both maximum profit and maximum loss are not limited.

Conclusion:

* Inverse compound interest is a concept that represents the phenomenon opposite to compound interest. While compound interest describes a process where profits grow cumulatively, inverse compound interest describes a process where losses diminish. As the investment value decreases repeatedly, the relative loss becomes smaller with each additional decrease, as the principal is reduced.

* In simple returns, the calculation is straightforward, describing that in long-term investments, the maximum loss is 100%, while the maximum profit is unlimited—a clear advantage for "buy and hold" long-term investments.

* When working with graphs, a 10% decrease will appear identical regardless of the stock price level on a logarithmic chart.

* When performing comparisons, intersections, simulations, examining historical data using Back Testing or artificial intelligence, it is mandatory to work with logarithmic returns. This simplifies calculations and ensures that phenomena and patterns are described identically.

Return and Volatility in the PNP Project

Objective

This appendix explores the significance of assessing financial performance through both return and volatility. A comprehensive evaluation of these factors is crucial when analyzing stocks, trading indicators, or AI-driven investment strategies. By incorporating volatility into return-based assessments, investors can gain a deeper understanding of risk-adjusted performance and make more informed decisions.

Interplay Between Return and Volatility

The PNP Index provides a systematic approach to performance measurement, focusing on two core components:

1. Return – Represents the profit or loss generated by an investment over a specified period.

2. Volatility – Reflects the degree of fluctuation in returns, serving as a key risk indicator.

A high return is not inherently desirable if accompanied by excessive volatility. For instance, a stock yielding 20% annually with a volatility of 30% presents a higher risk profile than one delivering 15% with a volatility of 10%. Investors must weigh both metrics to determine the stability and sustainability of returns.

Risk-Adjusted Performance Evaluation

Focusing exclusively on maximizing return without factoring in volatility can lead to excessive exposure to risk. The PNP Index ensures that increases in return do not come at the expense of stability, making it particularly valuable for algorithmic trading and portfolio optimization. By standardizing performance assessment, the index facilitates a structured approach to risk management.

Conclusion

Evaluating return alone is insufficient for assessing performance in financial markets. Combining return and volatility is essential to gain a complete understanding of the risk and potential of an asset or strategy. The PNP Index provides an ideal solution, standing out with its ability to evaluate performance accurately, realistically, and comprehensively. In the future, this index could be used to enhance trading strategies, select better-performing stocks, and derive deeper insights into market behavior.

Refining Probability Analysis: Net Profit and Certain Probability

Introduction

In probability and statistical analysis, evaluating success and failure dynamics plays a crucial role in decision-making. Traditional probability metrics focus on the likelihood of success, but this article introduces a structured framework incorporating **Net Profit (Np)** and **Net Complement (Nc)** to better analyze performance.

To ensure accuracy in all scenarios—including cases where net profit is negative—we refine the formulas to consider absolute values where necessary. This ensures that probability remains a valid measure, always between 0 and 1.

Defining the Fundamental Terms

We start with the core elements of any probability-based system:

- **Successes (W)** – The number of successful outcomes.

- **Failures (L)** – The number of unsuccessful outcomes.

- **Total Trials (G)** – The total number of attempts:

    G = W + L

- **Net Profit (Np)** – The difference between successes and failures:

    Np = W − L

- **Net Complement (Nc)** – The complement to the net profit, representing the remaining portion of the trials:

    Nc = G − |Np| = 2L   (since |Np| = |W−L|)

Thus, **Nc** accounts for the portion of trials that do not contribute positively to net profit, regardless of whether Np is positive or negative.

Probability Calculations

To ensure that probability remains a valid measure between 0 and 1, we use the absolute value of Np in the following calculations:

1. **Certain Probability** (P_{certain}) – The proportion of net profit relative to the total trials:

$$P_{\text{certain}} = \frac{|Np|}{G} = \frac{|W - L|}{W + L}$$

2. **Uncertain Probability** ($P_{\text{uncertain}}$) – The proportion of net complement relative to the total trials:

$$P_{\text{uncertain}} = \frac{Nc}{G} = \frac{2L}{W + L}$$

By definition, these probabilities always sum to 1: Pcertain + Puncertain = 1

This ensures a complete representation of the success-failure dynamics in any given dataset, even when Np is negative.

Interpreting the Results

To provide a **probabilistic dimension to performance evaluation**, we draw an analogy between W (successes) and positive returns and L (failures) and negative returns.

1. $W > L$ (More successes than failures)

   - This scenario indicates a clear dominance of positive outcomes.

   - A high P_{certain} suggests strong predictability and favorable conditions for long positions.

2. $L > W$ (More failures than successes)

   - Surprisingly, this scenario can **still be advantageous** if short-selling is possible.

   - A trader or investor may leverage this information to benefit from negative trends, making the ability to act on short trades as valuable as traditional long positions.

3. $W = L$ (Equal successes and failures)

   - This is the **worst-case scenario** because there is no statistical advantage in either direction.

   - Here, $P_{\text{certain}} = 0$ and $P_{\text{uncertain}} = 1$, indicating maximum uncertainty.

   - In this state, market conditions or strategy adjustments are needed to gain an edge.

By using **Net Profit (Np) and Net Complement (Nc)** as key indicators, we provide a clearer way to analyze performance, especially in fields such as **finance, statistical modeling, and decision-making processes**.

Conclusion

This framework provides an intuitive way to assess success and failure dynamics beyond traditional probability measures. By ensuring that probability remains valid under all conditions, the refined definitions allow for greater flexibility and accuracy in analysis.

By acknowledging that **both positive and negative returns can be leveraged strategically**, this model adapts to various financial applications, including **risk assessment, long-short strategies, and experimental research**. Future studies could explore integrating these concepts with machine learning models, optimization algorithms, and predictive analytics.

Short Selling with PNP: A Complementary Approach

Introduction

When evaluating a stock or strategy in a short position, it is necessary to adjust the PNP scale to properly assess the performance and risk of the investment. Since PNP is designed to measure the probability of positive versus negative returns, applying it directly to short positions without modifications would yield misleading insights.

To address this, the concept of an inverse PNP scale is introduced:

$$NPP = 1 - PNP$$

Where NPP (Negative-positive probability) represents the flipped scale for short positions, providing an accurate reflection of the investment's performance when betting against an asset's rise.

Alternatively, traders can utilize the Pcertain metric, which is inherently structured to facilitate comparisons between long and short positions without requiring a transformation. This makes it an efficient and intuitive choice for evaluating both types of trades on a consistent basis.

Understanding the NPP Adjustment

For long positions, PNP is calculated based on the ratio of positive return periods to the sum of positive and negative return periods. However, in a short trade, profits occur when the asset declines, which is the inverse of a long position's gain. Instead of recalculating PNP in reverse, using NPP allows for a direct conversion:

- If a stock has a high PNP in a long position, it will have a low NPP in a short position, indicating that shorting it may be a poor strategy.

- Conversely, a low PNP in a long position suggests a high NPP for shorting, making it a potentially favorable candidate for a short trade.

By implementing NPP, traders can assess short positions using the same analytical framework as long positions while ensuring accuracy in probability assessments.

The Advantage of Pcertain

While NPP provides a practical solution for short selling evaluations, Pcertain offers a more universal approach by integrating both long and short probabilities into a unified measure. Pcertain inherently adjusts for directional bias, allowing traders to directly compare strategies without the need for separate scales.

This adaptation streamlines decision-making by enabling direct assessments of trade effectiveness without recalculations, ensuring that both long and short strategies are evaluated under consistent probabilistic metrics.

Practical Application in Trading Strategies

Implementing NPP or Pcertain into a trading strategy can significantly improve the accuracy of backtesting and performance analysis. By ensuring that short trades are evaluated on an appropriate scale, traders can:

- Identify optimal short opportunities using historical performance data.

- Compare long and short trades with an unbiased probability framework.

- Avoid misinterpretations of traditional performance metrics that are designed primarily for long positions.

By integrating these adjustments into the PNP framework, traders can enhance the robustness of their strategy evaluation and optimize their portfolio positioning accordingly.

Example: Demonstration of the PNP Index

Objective: This example demonstrates the calculation and analysis of the Positive-Negative Probability (PNP) index based on a simple dataset.

Trading day	Daily log return	positives	negatives	
1	3	3	0	
2	-2	0	2	
3	4	4	0	
4	2	2	0	
5	1	1	0	
6	-3	0	3	
7	1	1	0	
8	-1	0	1	
9	2	2	0	
10	3	3	0	

Sum LR >	10	%	
Daily Std	2.309401077		
Sharp	4.330127019		
Total positives	16	W - Number of times won	
Total negatives	6	L - Number of times loss	
Total LR	10	Np - Total net profit = W - L	
Control Group	22	G - Number of draws = W + L	
PNP %	72.7273%	Probability = W / G	
P certain %	45.4545%	Certain Probability = |Np| / G	
P uncertain %	54.5455%	Uncertain Probability = 1 - Pcertain = 2L / G	
Std 1 unit	0.445361771	Volatility_binomial == Volatility_std for 1 unit	
Volatility	2.088931871	Std Calculated from Volatility_binomial	

Dataset Overview:

The dataset contains daily logarithmic returns (r) for a trading period, split into positive and negative contributions.

Trading Day	Daily Log Return (r)	Positives (r^+)	Negatives (r^-)
1	3.0	3.0	0.0
2	-2.0	0.0	2.0
3	4.0	4.0	0.0
4	2.0	2.0	0.0
5	1.0	1.0	0.0
...	...	...	...

Calculations

1. **Total Positive and Negative Returns**

   - **Total Positives**: The sum of all positive daily log returns.

   $$\text{Total Positives} = \sum \text{Positives} = 3.0 + 4.0 + 2.0 + 1.0 = 16.0\%$$

   - **Total Negatives**: The sum of all negative daily log returns.

   $$\text{Total Negatives} = \sum \text{Negatives} = -2.0 = -6.0\%$$

2. **Number of Successes and Losses**

   - **Number of Successes**: Each positive return contributes 1 success for every 1%.

   $$\text{Number of Successes} = 16$$

   - **Number of Losses**: Each 1% in negative returns contributes 1 loss.

   $$\text{Number of Losses} = 6$$

3. **Number of Draws**

   The total number of draws is the sum of successes and losses.

   $$\text{Number of Draws} = \text{Number of Successes} + \text{Number of Losses} = 16 + 6 = 22$$

4. **PNP (Positive-Negative Probability)**

   PNP is calculated as the ratio of successes to draws.

   $$\text{PNP} = \frac{\text{Number of Successes}}{\text{Number of Draws}} = \frac{16}{22} \approx 0.727$$

5. **Certain Probability**

   The Certain Probability is calculated as the ratio of **Total Net Profit** to **Number of Draws**.

   $$\text{Total Net Profit} = \text{Total Positives} + \text{Total Negatives} = 16 - 6 = 10\%$$

   $$\text{Certain Probability} = \frac{\text{Total Net Profit}}{\text{Number of Draws}} = \frac{10}{22} \approx 0.455$$

6. **Uncertain Probability**

   The Uncertain Probability is now defined as:

   $$\text{Uncertain Probability} = 1 - \text{Certain Probability}$$

   $$\text{Uncertain Probability} = 1 - 0.455 = 0.545$$

7. **Volatility (Binomial)**

For a single unit (one draw), the binomial volatility is calculated as:

$$\text{Volatility} = \sqrt{\text{PNP} \cdot (1 - \text{PNP})}$$

Substituting values:

$$\text{Volatility} = \sqrt{0.727 \cdot (1 - 0.727)} \approx 0.447$$

For the entire dataset (22 draws):

$$\text{Volatility (Binomial)} = \sqrt{\text{Number of Draws} \cdot \text{PNP} \cdot (1 - \text{PNP})}$$

Substituting values:

$$\text{Volatility (Binomial)} = \sqrt{22 \cdot 0.727 \cdot (1 - 0.727)} \approx 2.089$$

Conclusion

This example illustrates the step-by-step computation of the PNP index and related metrics, showcasing its usefulness in evaluating the performance of trading strategies or investment algorithms. The PNP index provides insights into the probability of positive returns while incorporating volatility and other risk factors.

PNP Index vs. Sharpe Ratio

Introduction

When assessing stock performance, both the **Sharpe Ratio** and the **PNP Index** account for **returns** and **volatility**. However, they do so in different ways, which leads to fundamental differences in evaluation results. The **PNP Index** gives more weight to returns and operates on a **probabilistic principle**, whereas the **Sharpe Ratio** relies on the concept of excess returns relative to volatility and incorporates the risk-free rate.

This article explores the key differences between these two metrics, highlights their strengths and weaknesses, and provides insights into their real-world applications.

1. PNP Emphasizes Returns More Than the Sharpe Ratio

One of the key distinctions between the two metrics is how they prioritize returns versus volatility. Consider the following stocks:

Stock	Return (%)	Standard Deviation	PNP (%)	Sharpe Ratio
Stock 1	10%	2.3094	72.7273%	4.3301
Stock 2	15%	3.5764	72.8659%	4.1940
Stock 3	21%	6.6742	74.4186%	3.1465

See calculations at the end of the article.

From this table, we observe:

- **PNP prioritizes Stock 3** due to its superior return, despite its higher volatility.

- **Sharpe Ratio favors Stock 1**, which has the lowest volatility.

  This indicates that PNP provides a more return-driven assessment, whereas Sharpe penalizes stocks with high volatility even if they generate strong returns.

2. PNP Operates on a Probabilistic Principle – No Risk-Free Rate Needed

The **Sharpe Ratio** requires a **risk-free rate** as a benchmark for calculating excess returns. This dependency introduces complications when market conditions fluctuate, as determining an accurate risk-free rate can be challenging.

PNP, however, does not require a risk-free rate, making it a self-sufficient comparative metric. It simply evaluates the proportion of positive vs. negative returns on a relative scale, offering a straightforward and intuitive way to compare investments.

3. PNP Provides a Well-Defined Positive/Negative Ratio

The PNP Index fundamentally measures the ratio of positive returns to total absolute returns but scales it to a convenient range for comparative analysis. This characteristic ensures that performance evaluations remain consistent and comparable across different market environments.

4. PNP Excels in Short Selling and Bear Market Analysis

Traditional performance metrics, including Sharpe, tend to focus on long-only strategies. The PNP Index, however, can equally assess both long and short positions, making it a valuable tool for traders and portfolio managers engaged in short-selling strategies.

For example:

- If a stock consistently declines, a short seller benefits, but traditional metrics may struggle to reflect this performance effectively.

- PNP can directly measure performance in both rising and falling markets, making it ideal for evaluating short trades.

5. PNP is More Reliable in Algorithmic Trading and AI-Based Strategies

When indicators such as moving averages, RSI, or AI-driven strategies are applied, they often increase volatility artificially. The Sharpe Ratio penalizes this increased volatility, potentially leading to underestimation of actual performance.

In contrast, PNP provides a more accurate performance evaluation in such scenarios by focusing on the actual distribution of positive vs. negative returns rather than excessive sensitivity to volatility.

Calculations for Stock 1, Stock 2 and Stock 3:

Trading day	Daily log return	positives	negatives	
1	3	3	0	Stock 1
2	-2	0	2	
3	4	4	0	
4	2	2	0	
5	1	1	0	
6	-3	0	3	
7	1	1	0	
8	-1	0	1	
9	2	2	0	
10	3	3	0	

Sum LR >	10	%	
Daily Std	2.309401077		
Sharp	4.330127019		
Total positives	16	W – Number of times won	
Total negatives	6	L – Number of times loss	
Total LR	10	Np – Total net profit = W – L	
Control Group	22	G – Number of draws = W + L	
PNP %	72.7273%	Probability = W / G	
P certain %	45.4545%	Certain Probability = |Np| / G	
P uncertain %	54.5455%	Uncertain Probability = 1 – Pcertain = 2L / G	
Std 1 unit	0.445361771	Volatility_binomial == Volatility_std for 1 unit	
Volatility	2.088931871	Std Calculated from Volatility_binomial	

Trading day	Daily log return	positives	negatives	
1	3	3	0	Stock 2
2	-5	0	5	
3	4	4	0	
4	6	6	0	
5	1	1	0	
6	-2.9	0	2.9	
7	1	1	0	
8	-1	0	1	
9	5	5	0	
10	3.9	3.9	0	

Sum LR >	15	%	
Daily Std	3.576466288		
Sharp	4.19408399		
Total positives	23.9	W – Number of times won	
Total negatives	8.9	L – Number of times loss	
Total LR	15	Np – Total net profit = W – L	
Control Group	32.8	G – Number of draws = W + L	
PNP %	72.8659%	Probability = W / G	
P certain %	45.7317%	Certain Probability = |Np| / G	
P uncertain %	54.2683%	Uncertain Probability = 1 – Pcertain = 2L / G	
Std 1 unit	0.444651857	Volatility_binomial == Volatility_std for 1 unit	
Volatility	2.546578288	Std Calculated from Volatility_binomial	

Trading day	Daily log return	positives	negatives	
1	3	3	0	Stock 3
2	-2	0	2	
3	4	4	0	
4	-6	0	6	
5	19	19	0	
6	-2	0	2	
7	1	1	0	
8	-1	0	1	
9	2	2	0	
10	3	3	0	

Sum LR >	21	%	
Daily Std	6.674162453		
Sharp	3.146462219		
Total positives	32	W – Number of times won	
Total negatives	11	L – Number of times loss	
Total LR	21	Np – Total net profit = W – L	
Control Group	43	G – Number of draws = W + L	
PNP %	74.4186%	Probability = W / G	
P certain %	48.8372%	Certain Probability = |Np| / G	
P uncertain %	51.1628%	Uncertain Probability = 1 – Pcertain = 2L / G	
Std 1 unit	0.436317745	Volatility_binomial == Volatility_std for 1 unit	
Volatility	2.861126791	Std Calculated from Volatility_binomial	